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Electrical World

NEWS ISSUE NOVEMBER 16, 1946

R. L. White, Retiring President of NEMA, Congratulates His Successor, R. Stafford Edwards

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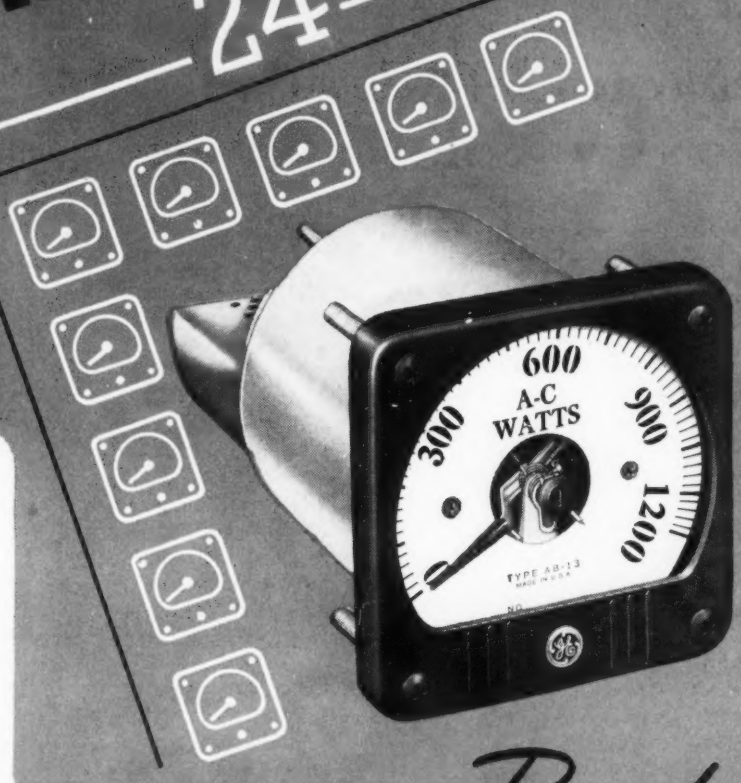
25 LONG-SCALE instruments in a 24" square



TYPES

AB-13—A-C

DB-13—D-C

VOLTMETERS
A-C & D-C

AMMETERS
A-C & D-C

WATTMETERS

VARMETERS

POWER-FACTOR METERS

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FREQUENCY METERS

ALSO

Temperature Meters

Tachometers

concentrated *Readability*

Never before has it been possible to get so many switchboard instruments in such a small space—with an actual *increase* in readable accuracy. Only 4¼-inches square, five of these compact, long-scale instruments can be mounted side-by-side on a 24-inch panel.

For the user—better instrumentation: Information on one or more circuits can be concentrated in a small area; many instruments can be read from one position; time can be saved in recording readings; and circuit data can be better correlated.

For the switchboard manufacturer—better panels: Valuable panel space can be more efficiently utilized; added economy in panel layout can be realized; and the size of the switchboard may even be reduced.

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ELECTRICAL WORLD

NEWS ISSUE

VOLUME 126 NUMBER 20

NOVEMBER 16, 1946

National Farm Electrification Conference Voted a Success

Permanent Organization Set Up to Arrange for Next Year's Program—350, Including Representatives of Cooperatives, Attend Chicago Meeting—Correlation of Activities Urged

CLOSING with action to hold another meeting next year, the first National Farm Electrification Conference was unanimously voted a success by more than 350 representatives of 13 participating organizations meeting in Chicago last week. Arranged for the purpose of bringing together the many groups which are interested in different phases of the use of electricity on farms, this first meeting resulted mainly in an exchange of ideas and in acquainting all groups with the activities of others with similar objectives.

George W. Kable, editor, *Electricity on the Farm*, and chairman of the conference committee, emphasized the varied interests represented, including farmer organizations, educational institutions, press, power suppliers, manufacturers, distributors, dealers, contractors and trade associations, and set the keynote as the profitable utilization of electricity. He noted that although REA had declined to join in sponsorship of the conference, invitations to attend had been sent to managers and superintendents of rural electric cooperatives, and that many were present. He stated that extension of service to farms is nearing completion and does not need discussion in the present program to make electric service as useful in agriculture as it is in industry.

F. T. Whiting, Westinghouse Electric Corp., urged a permanent association to correlate all data on the most efficient applications of electrical service for farm use and to act as a clearing house in collecting and disseminating information. He pointed to the vast educational job remaining to be done by the electrical industry and other agencies concerned with improving farming standards. Frank Watts, *Farm Journal*, also proposed continuing the organization and further suggested that an exhibit of new equipment and educational material should feature the next meeting. A motion to this effect was given an affirmative vote.

P. T. Montfort, Texas A. & M. College, asked for coordination of educational material and bulletins. Emphasizing the severe shortage of trained personnel in the field, he outlined the extension courses and service that are needed in colleges and trade schools to acquaint staffs with equipment, farming methods and service techniques. Both basic training programs and continuous refresher type programs are necessary, in his opinion.

Harry J. Reed, Purdue University, outlined research activities to establish design requirements for mechanizing farm tasks and the utilization studies that have been made in the past. Such research must be aimed specifically at reducing the time and labor required for specific chores, with efficient arrangement of buildings and equipment coordinated in the development of new devices.

Farm wiring can become a serious bottleneck in the use of electricity, said William A. Ritt, North Central Electrical Industries, suggesting that the average farm must be considered as an industrial plant. Installing and servicing equipment form a huge new market, and the key man in this job is the electrical specialty dealer in the rural area, in the opinion of Charles G. Pyle, National Electrical Wholesalers Association. High pressure selling is out of place in this field, he said.

Power suppliers have the task of taking to the farmer the many improvements that are made in processes by other agencies who lack the personnel for continuous contact. This

CONFERENCE OFFICERS—George W. Kable, chairman; George Rietz, chairman of the Program Committee; and Truman Hienton, vice-chairman

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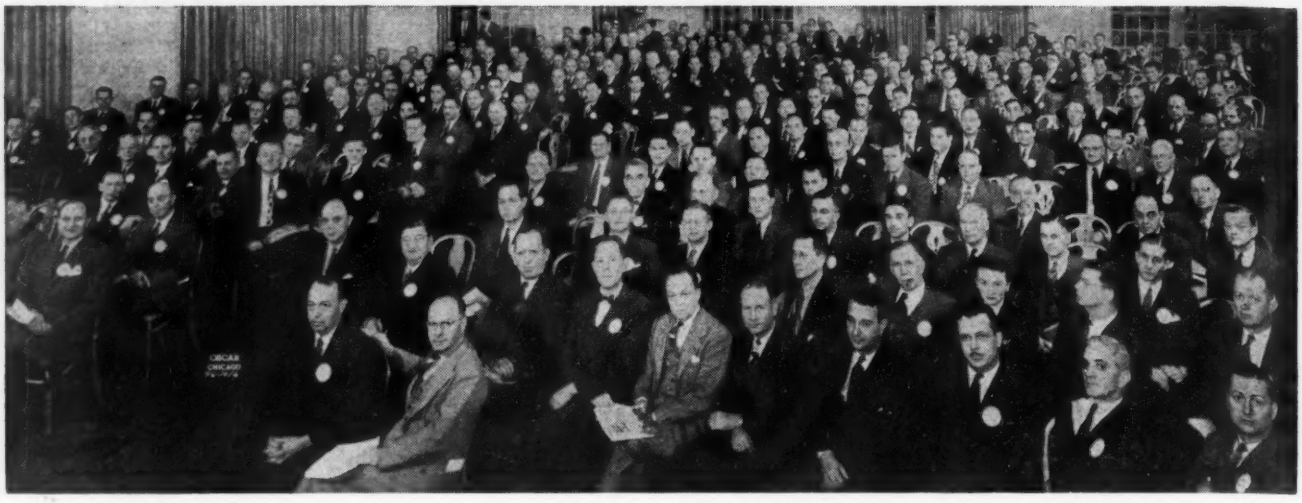

THE AUDITORIUM WAS JAMMED—Attendance at first National Farm Electrification Conference exceeded all expectations

objective should be the basis of an agricultural development department entirely separated from the regular commercial department and operated solely in the interest of farm users of the utility's service in the opinion of A. C. Spurr, Monongahela Power Co., whose paper was delivered by C. H. Leatham.

C. H. Lang, General Electric Co., presented a new motion picture prepared as a part of its program to reach farm leaders. Discussion of this and several other presentations pointed to the need for further technical information for use by agricultural advisers. The industry is past the elementary stage of education, and training aids are the greatest need now, in the opinion of several who discussed the problems of applying and servicing equipment.

Dr. Gladys Gallup, U. S. Department of Agriculture, reported on analysis of bulletins prepared for farm electrification use. Half of this material is written over the level of easy reading interest, she concluded, in emphasizing the value of simple presentations. Charts prepared by the department show the cumulative effects of individual contacts in selling, of group meetings, mass methods and the indirect influence as use grows.

Miss Gertrude Dieken, *Farm Journal*, told the conference that the farmer's wife is worth $69,000 to her husband in his business, but she must be relieved of carrying water, wood and coal so that she may have a chance to concentrate on that cooperativeness.

To carry the purposes of this first conference into another year and to arrange its continuance, officers were elected at the close of the meeting.

Hansel Schenck, Indiana Farm Bureau, Indianapolis, was elected chairman. George W. Kable, chairman of this year's committee, was elected vice-chairman, and Russell Gingles, National Electrical Manufacturers Association, is to be the secretary-treasurer.

THE CO-OPS WERE REPRESENTED—C. H. Gelder, left, Dakota County Electric Cooperative, Farmington, Minn.; H. A. Lohmann, Goodhue County Cooperative Electric Association, Zumbrota, Minn.; C. H. Lang, General Electric Co.; F. T. Whiting, Westinghouse Electric Corp.; George W. Bleecker, Goodhue Co-op

2 G.O.P. Leaders Predict Legislation against Strikes

Republican legislators, now in Washington to prepare for the session starting January 1, predicted early enactment of legislation to settle labor disputes in public utilities.

Two party spokesmen, Senators Joseph H. Ball of Minnesota and Homer Ferguson of Michigan, suggested specific measures for coping with strike threats among utility employees.

Senator Ball expressed confidence that Congress would adopt legislation patterned upon the Case Bill, which was killed last session by presidential veto. The Case Bill provision setting up special mediators for utility labor disputes probably will be modified in the new version.

A possible future approach to the problem is Senator Ferguson's proposal to establish Federal Labor Courts to settle disputes in public utilities and other "vital" industries. The Labor Court system, with district and appellate benches and a Supreme Labor Court, would take over a labor dispute when collective bargaining failed or when either labor or management requested its assistance.

Strikes would be outlawed for a period of 30 days or more while the court considered each case. Refusal to abide by a Labor Court decision would subject an employer to prosecution under unfair labor practice provisions of the Wagner Act. Workers would be subject to loss of their rights under the Act if they failed to observe court orders.

Senator Ferguson told ELECTRICAL WORLD that his plan would require considerable study and, possibly, revision before he could present it in the form of a bill to the Congress.

Buyers' Market for Electrical Appliances Near, Utilities Told

Sales Section of Southeastern Electric Exchange Advises Aggressive Promotion and Intensive Merchandising Plans —Expansion in Home Construction Will Mean More Sales

ON PROGRAM—J. S. Sutherland, left, manager of residential and commercial division, Alabama Power Co., and James T. Coatsworth, commercial director of Edison Electric Institute, New York City.

AGGRESSIVE promotional and intensive merchandising programs should be instituted to keep pace with the present trend from sellers' to buyers' market for electrical appliances, utility officials were told last week at the Sales Section of the Southeastern Electric Exchange meeting in Atlanta. Indications that selective purchasing with emphasis toward quality merchandise, with price as an important factor, is becoming more pronounced were shown by speakers who reviewed production and market conditions.

The outlook for electrical appliances was given by A. H. Jaeger, manager of utilities division of Hotpoint. He declared that the current demand for appliances will be filled earlier in 1947 than many people had expected and that buyers will want to see the value of goods they are offered. "This return to normal," Mr. Jaeger said, "will call for a return to selling."

Mr. Jaeger said that more architects and builders now have a greater appreciation of electrical appliances and that the expansion in home construction will mean a greater appliance market, including the all-electric kitchen. He declared that the kitchen package plan is a good promotion and offers great sales opportunities among the 8,000,000 new married families and the 2,000,000 families who have doubled up during the housing shortage.

R. S. Bell, merchandising supervisor of Commonwealth & Southern Corp., said that the ten companies in the system will continue the pre-war selling plan and dealer cooperation. His experiences have been that the utility must do a great deal of promotional work if load building is to be successful. The plan calls for full, close cooperation with dealers, together with aggressive selling of standard appliances on a fair, sound, competitive merchandising basis. The companies charge all costs to the merchandising department.

Harry M. Kelley, appliance sales manager of Frigidaire, said that while appliance production today is below the goal set a year ago, there is little indication that it can be raised sufficiently in the immediate future to make possible a quick reduction in the backlog of unfilled orders. He said that the high cost of living is absorbing a large portion of savings and is having a decided effect on appliance sales.

That the utilities are preparing for intensive selling campaigns was seen in the many specific programs now in preparation. H. E. Cox, vice-president of Birmingham Electric Co., said that sales plans for 1947 should be built around selling the need and value of electric service.

Commercial cooking offers excellent load-building possibilities but needs personal contact to accomplish the best selling job, in the opinion of Luther T. Cale, commercial manager of Birmingham Electric. He pointed out that it is necessary for salesmen to call on customers an average of three to four times a year, and that they should give special attention to small customers, who make up the bulk of the market.

One of the most desirable types of load is air conditioning, said John D. Haverkamp, New Orleans Public Service, Inc., who pointed to its high annual load factor. He said that the rapid growth in locker plants and air conditioning is adding substantial load to the system.

Some of the factors of dealer coordination and development were discussed by E. T. Moon, Virginia Electric & Power Co., who said that many of the newly appointed dealers are firms which have taken on appliances as a new side line. He declared that they are anxious to develop the appliance department and welcome cooperation and suggestions.

The pyramiding of electrical appliance use in the home is developing a problem for the utilities, both from a service cost and from a service use standpoint, said J. S. Sutherland, manager of residential and commercial division of Alabama Power Co. He saw the possibility that the utilities may be forced to institute a demand charge.

All the tools available for advertising, sales promotion, and publicity were widely discussed by the advertising committee at which J. K. Flanagan, Florida Power Corp., presided, E. N. Pope, Carolina Power & Light, presented a comprehensive outline of the organizational work of the advertising department and the multiplicity of functions it performs. C. M. Kilian, Alabama Power, presented ways of advertising material and equipment shortages to win public confidence during the critical period.

At the afternoon session, at which Roy Knox, Birmingham Electric, pre-

REPRESENTING THREE UTILITIES—L. L. Koontz, division rural supervisor, Appalachian Electric Power Co.; Les M. Taylor, vice-president of Mississippi Power & Light Co.; J. F. Crist, vice-president of South Carolina Power Co.

sided, L. Edwin Gill, Jr., of New Orleans Public Service, presented the promotional value of equipment shows. Ed Raddatz, National Association of Electric Companies, analyzed a report on studies of radio advertising and expressed the opinion that the utilities could make profitable use of the radio in getting their story across to the public.

The Agricultural Development Committee, at which L. L. Koontz, Appalachian Electric Power, presided, developed fruitful discussions of problems in building up the rural areas and the greater use of electricity through sale of appliances and labor-saving machinery.

The industrial power committee, with W. Paul Lyman, Carolina Power & Light, developed discussions as to means of obtaining a better load factor and installation of equipment to do a better job as well as to expand service. H. Chester Gause, Alabama Power, told how 15,500 kva. in capacitors installed by industrial customers in the Mobile area improved the system load power factor from 70 percent to 81.3 percent with a saving of 10,000 kva. in distribution and transmission system capacity.

Three committee and one two-day general sales sessions made up the conference which was attended by more than 200 sales and advertising officials from utilities in the Southeast.

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Asks Higher Depreciation Because of Atomic Power

The application of atomic energy to power plants was given as one of a number of mechanical improvements which will reduce the useful life of its equipment by the Louisville Gas & Electric Co. in an income-tax petition filed recently in the Federal Court at Louisville.

The suit was filed against Seldon R. Glenn, Collector of Internal Revenue, over income and excess profits taxes for 1939 through 1941. Chief point of contention is the question of depreciation. The utility asks for a return of $140,238 in taxes it claims the government exacted illegally.

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Vote Bonds for System

Citizens of Ava, Mo., have approved a $125,000 bond issue to finance the purchase of the existing electric distribution system or for the erection of a power plant and a distribution system. The town is now served by the Missouri Electric Power Co.

Slim Generating Reserves Concern System Operators

Eastern Chief Dispatchers at P.E.A. Meeting Report Shrinking Margins and Progressive Difficulty in Releasing Machines for Maintenance—Loads and Outputs Continue Upward Trend

GROWING INSUFFICIENCY of generation reserves throughout the 15,000,000-kw. Northeastern area with no early relief in sight was a matter of serious consideration at a meeting of some 50 members and guests of the Systems Operation Committee of the Pennsylvania Electric Association at Skytop on November 7 and 8. Other major topics were the load pickup abilities of the various stations, trends in new dispatching boards, recording of operating conversations, and use of helicopters for inspection of transmission lines.

Reserves to Be Scant until 1948

Not until 1948 does it appear that the Northeastern area will achieve any relief from the present scant margin of installed generating capacity above the actual and the impending peaks. Reports submitted from some 19 company and interconnection areas reaching from Washington to Buffalo and Boston show that the margin of aggregate installed capacity (16,577 mw.) over the already experienced 1946 peak (14,599 mw.) is only 11.8 percent. For the expected December loads the margin will decrease slightly to 11.7 percent. In 1945, the spread was 16,499 mw. over 13,151 mw. or 12.6 percent; in 1944 the reserve installed was 12.65 percent. But in 1947 it will drop to 10 percent and even with the expected additions of 2,500,000 kw. between now and the 1948 peaks the margin will recover to only 11.8 percent. These aggregates involve some duplications.

1946 Reserve about 6 Percent

Actual generating capacities available under appropriate maintenance schedules are enough less than the figures cited for installed capacity to make the true 1946 operating reserve for the area only about 6 percent—a matter of natural concern to system operators, to say the least. Flattening of curves is accentuating the deficiency in some areas.

Outputs follow the national pattern; load factors are now estimated to be 5 percent below the war-time values which ranged from 50 to as high as 70 percent.

The tightness of capacity during the coming year will necessitate the most careful, errorless functioning by system operators, said C. P. Corey in describing New England Power's 98.7 percent "good" performance in some 3,483 relay operations in 1945 along with some 10,000 synchronizations by operators.

Preliminary data assembled by Chairman H. W. Phillips indicated wide range of reported values for load pickup on generators from 80 toward 100 percent loads, only the 1,200 psi. stations showing consistency; their rates range from 1 to 2½ percent per minute under normal conditions, more under emergency. Economy stations are loaded ahead of schedules to meet the 8 or 9 percent rises often called for at time of peak.

Baltimore Board Described

Discussion of several new dispatching boards reflected a tendency toward using lights only for abnormal conditions and the use of prints or drawings to represent the system. The new Baltimore board was described by T. A. Andrews as being of 4 by 12-ft. sections of perforated aluminum with colored adhesived-paper for lines and equipment representation.

Recording of all dispatching conversations is accomplished on the Long Island Lighting system by means of a Recordgraph. It makes a trace on a 50-ft. acetate film which affords 115 tracks or 5,750 ft. of record, about 2¾ hours of continuous operation. In normal use one film lasts four days, said W. O. Smith.

He added that the device was chosen for permanence, fidelity, prompt starting and ruggedness in preference to wax or magnetic equipments. Two other companies cited adoption of the Soundscriber for similar application.

Demonstration of a Sikorsky 3-passenger helicopter was given the group by Joseph Parrish of Helicopter Air Transport, Inc., after showing a Bell Aircraft film. It was stated that Eastern utilities are contemplating collaboration in a field demonstration for line inspection.

Higher Prices but Nothing Else Sure as OPA Ends

President Truman's order ending price control is expected to effect sharp rises in the cost of electric power generating equipment, turbines, line materials, and other electrical equipment through substantial increases in the prices of raw material used in their manufacture.

Because of the uncertainty in official circles as to what further restriction on industrial production and supply lines are to follow the decontrol of prices, it still is impossible to predict the full impact of decontrol on the utility industry and the manufacturers who supply it.

Importation Subsidy Ceases

Electrical equipment manufacturers are certain, however, to feel the effects of the order upon their raw material supply lines. Heavy increases in the prices of copper, lead, zinc, and tin already have resulted, with indications of further rises in the near future. With the end of price control the government's subsidy importation of copper, lead and tin ceased, throwing purchasers of these metals on the open world market for the first time since the war.

Reconstruction Finance Corporation will continue to import metals on a cost basis, duty waived, until about January 1. RFC is planning to discontinue its importation of metals as soon as private industry has supplies arriving at docks in this country.

The Utilities Division now operating within the OPA was unaffected by the decontrol order, since it was established under the Stabilization Act of 1942 and obtained its funds from appropriations for John Steelman's Office of Economic Stabilization. There is some possibility, however, that this agency may be removed from OPA to the Steelman offices. The Utilities Division also retains its authority to require 30-day notices of proposed utility rate increases and to intervene in rate cases.

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P. U. D. May Issue Note

A public utility district may borrow money by issuing a revenue note, Smith Troy, Washington state attorney general, advised State Auditor Cliff Yelle concerning the Clark County P.U.D. of Vancouver, which had issued an electric revenue note for $75,000 payable to Ballard-Hasset Co. of Des Moines, Iowa. Troy said the note in question is, for all practical purposes, the same as a bond.

5% Set as Fair Rate of Return by FPC

A new pattern for reduction of electric utility rates may have been established last week by the Federal Power Commission in its findings in the Safe Harbor Water Power Corp. case.

FPC fixed 5 percent as the allowable fair rate of return for Safe Harbor's electric utility operations—the lowest rate of return ever set by the commission. More significant, perhaps, was FPC's order allowing the company a return on its net investment less a fixed annual charge for depreciation calculated by the "straightline" method.

The Safe Harbor rate of return is ½ percent lower than that allowed by FPC for the Chicago District Electric Generating Corp. in 1939 and 1 percent lower than the rate set last November in a gas utility case involving the Mississippi River Fuel Co. As it did in both the latter cases, FPC ruled that the Safe Harbor enjoyed financial and operational advantages (its sole customers are Consolidated Gas, Electric Light & Power Co. of Baltimore and Pennsylvania Water & Power Co.; these two companies also own all stock issued by Safe Harbor) not available to public utilities in general and that these advantages justified an unusually low rate of return.

On the other hand, FPC heretofore has not imposed the straight-line method of determining depreciation charges in electric utility rate cases. In a previous effort to reduce Safe Harbor's rates—which failed in a court test—the commission prescribed a compound-interest method for setting depreciation. On the other hand, FPC has required a number of gas utilities to adopt the straight-line method, and such orders were upheld by the courts.

Initiative 166 and 8 P.U.D. Proposals Lose in Voting

Another round in the Pacific Northwest private-vs.-public power battle ended November 5th with the private utility advocates winners—but not by a complete knockout.

In Oregon, the victory was a sound one, with voters in eight proposed people's utility districts—all that reached the ballot—refusing to approve the P.U.D. set-up, thus giving sanction to private companies now serving their communities. Facilities of Portland General Electric Co., Pacific Power & Light Co., California-Pacific Utilities, Mountain States Power Co., and Idaho Power Co. would have been subject to condemnation should the proposals have passed.

This was the fifth time a P.U.D. election has been held in Linn County, the third in Marion and Clatsop, and the second in North Lincoln, Malheur and Baker. Harney and Lane were voting on the question for the first time.

One of the strangest situations in the history of the national power conflict led to a 2-to-1 defeat of Initiative 166 in Washington. The measure, designed to require P.U.D. commissioners to submit proposed purchases of electric facilities to the voters, wound up with many persons not realizing what side of the issue they were favoring with a "yes" or a "no." Reason for the confusion was the fact that both public and private power backers were sadly split in their own camps.

Most commissioners were against the proposition, but a few favored it.

On the other hand, Frank McLaughlin, president of Puget Sound Power & Light Co., threw confusion into the minds of private power ranks by vigorously opposing the initiative. McLaughlin steadfastly denied that his stand on 166 had anything to do with the fact that his company is subject to advantageous sale to a group of P.U.D.'s if the state supreme court rules favorably on the legality of the transaction.

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South Carolina Power Co. Signs with Santee-Cooper

South Carolina Power Co., Charleston, has signed a three-year contract to buy 150,000,000 kw.-hr. of power annually from the South Carolina Public Service Authority (Santee-Cooper) at an annual cost of $800,000. The utility is obligated to sell much of the power to six co-ops in its territory at 7.5 mills a kw.-hr.

The Authority declined to give the utility a longer contract which it sought, but made the agreement because it has been unable to build transmission lines to serve the co-ops. The Authority will remit to the utility one-half of the state's tax charge on the resale of hydro power; this will amount to approximately $37,500 a year.

2nd Atomic Power Plant to Be Built at Schenectady

Arrangements have been completed for establishment of the fourth in a projected nationwide chain of nuclear physics research laboratories in the United States—a $20,000,000 institution to specialize in work in all phases of atomic power development to be built and operated for the government at Schenectady, N. Y., by General Electric Co.

The laboratory, to be designated the Knolls Atomic Power Laboratory, will be built around an atomic power pile of unstated size—second such projected uranium pile ever built primarily for creating atomic energy for peaceful applications; the other is to be at Oak Ridge, Tenn., where the world's first operating atomic-fueled power plant is to be set up.

Details of the contractual arrangement between the government and G.E. were not disclosed; G.E., however, is managing the Government's huge plutonium production factory at Hanford, Wash., for a $1-a-year fee.

The Knolls Laboratory will be built adjacent to General Electric's new fundamental research laboratory now under construction. The two institutions will be jointly operated but will maintain separate identities and ownership status.

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5-Hour Utility Strike Halts Service in St. Louis Area

Because the Union Electric Power Co., Monsanto, Ill., refused to suspend a worker at the request of Local 148, International Union of Operating Engineers, A.F.L., 200 members at the Venice and Cahokia plants conducted a five-hour strike which ended early Monday afternoon.

The union charged that the worker, a machinist at the Venice plant, had ignored instructions from a steward and asked the utility to suspend the man from November 11 to 30. The company replied that under its agreement providing for maintenance of union membership, it could act only when the union deemed a violation grave enough to expel a member from the organization.

Sunday evening the union voted to strike if the man continued on the job. When he reported for work Monday morning, the strike began. About 415,000 kw. out of a total of 750,000 kw. of capacity was taken off the line, forcing many industrial and commercial establishments to close, curtailing street car service in St. Louis, and shutting off electricity in thousands of homes between Alton, Ill., and the southern parts of St. Louis and St. Charles Counties in Missouri.

The strike ended when the union voted to expel the worker, and the company dropped him from its payroll.

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Narragansett Electric Co. Will Add 40,000-Kw. Unit

Narragansett Electric Co., Providence, R. I., a New England Power System utility, will add a 40,000-kw. turbogenerator, boiler, and coal handling facilities at its Manchester Street station. The cost will be about $7,000,000. The new equipment will not be in operation for three or four years, but a 40,000-kw. unit previously ordered will be placed in operation in 1947.

The latest machine on order will operate at 1,200 psi., condensing, and the new boiler will have a capacity of 450,000 lb. per hour. The new installations will necessitate additional coal storage space, and therefore new unloading and storage facilities are being planned for the water front along the so-called Hill Wharf property adjacent to the station.

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Carolina Strike Averted

The South Carolina Electric & Gas Co. and the International Brotherhood of Electrical Workers, A.F.L., have reached an agreement which averted a threatened strike. Though the contract is still to be signed and its terms have not been revealed, it is understood that they are a compromise between the 13-18 cents demanded by the union and the 5-11 cents offered by the utility. The union had originally asked for 30 cents an hour.

MEETINGS

American Standards Association—Annual meeting, Waldorf-Astoria Hotel, New York, November 21-22. Howard Coonley, chairman of the executive committee, 70 East 45th St., New York 17, N. Y.

Previously Listed

American Welding Society—Annual meeting, Ambassador Hotel, Atlantic City, N. J., November 17-22.

New Jersey Utilities Association—Annual meeting, Seaview Country Club, Absecon, N. J., November 22-23.

American Society of Mechanical Engineers—Annual meeting, Hotel Pennsylvania, New York, December 2-6.

National Exposition of Power and Mechanical Engineering—Grand Central Palace, New York, N. Y., December 2-7.

August Electric Energy Sales Increased 2.1 Percent

Sales of electric energy to ultimate customers in August, 1946, totaled 16,473,601,000 kw.-hr., compared with 16,138,653,000 kw.-hr. in August, 1945, an increase of 2.1 percent, according to the report issued by the Edison Electric Institute.

Revenue from ultimate customers amounted to $286,945,200 in August, compared with $275,021,900 in August, 1945, an increase of 4.3 percent.

Classification of Sales, August 1946 and Change from 1945

Kilowatt-hour sales August	Million Kw.-Hr. 1946	1945	% Change
Residential or domestic...	2,900	2,612	+11.0
Rural (Distinct rural rates)	548	478	+14.6
Commercial or industrial			
Small light & power....	2,815	2,497	+12.7
Large light & power....	8,953	9,147	— 2.1
Street & highway lighting..	168	161	+ 4.2
Other public authorities...	468	632	—26.0
Railways & railroads			
Street & interurban.....	352	346	+ 1.6
Electrified steam railroads	220	216	+ 1.9
Interdepartmental	51	50	+ 0.7
Total to ult. customers..	16,474	16,139	+ 2.1

For the twelve months ended August 31, 1946, the average use per customer advanced to 1,300 kw.-hr. from 1,197 kw.-hr. for the preceding year, an increase of 8.6 percent; the average annual bill to $42.64 from $41.42, an increase of 2.9 percent; revenue per kilowatt-hour dropped to 3.28 cents per kilowatt-hour from 3.46 cents per kilowatt-hour, a decrease of 5.2 percent.

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Hydro Offer Spurned

Two offers made by the Quebec Hydro Commission for the 4,500,000 shares of the Montreal Light, Heat & Power Cons. have been rejected by the directors of the utility. The first was an offer of $22.50 per share in cash, the other $1 a year for five years and 75 cents a year thereafter with the stock to be redeemable at any time after five years at $22.50 a share. Officials of the utility, which was expropriated in 1944, value the stock at $40 a share or more.

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Designates C.I.O. As Agent

The Utility Workers Union, C.I.O., has been designated collective bargaining agent for supervisory employees of the Southern California Edison Co.'s Long Beach steam plant, the National Labor Relations Board has announced. Excluded are the station chief and his assistant, the steam plant engineer, and the safety engineer.

NEWS ABOUT PEOPLE

Pennsylvania Association Elects Oakes President

Charles E. Oakes, president of the Pennsylvania Power & Light Co., Allentown, was elected president of the Pennsylvania Electric Association at the annual meeting held recently in Hershey.

Mr. Oakes became head of the Pennsylvania Power & Light Co. last year, going to Allentown from the Birmingham Electric Co., of which he had been president for six years. Before becoming chief executive of the Birmingham properties he had been identified with Pennsylvania Power & Light, joining the staff in 1923. After serving in various departments of the company he was made manager of the Allentown division, a position he occupied for twelve years. His early experience was obtained in Oregon and Idaho.

C. E. OAKES

Vice-presidents elected at the PEA meeting included: G. W. Ousler, vice-president in charge of sales, Duquesne Light Co.; W. H. Doran, vice-president, Metropolitan Edison Co.; and D. W. Jardine, president, Pennsylvania Electric Co.

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▶ EDWIN FLEISCHMANN recently resigned from Gilbert Associates, Inc., to establish an electrical engineering consulting practice in Palo Alto, Calif. While with Gilbert Associates, Mr. Fleischmann was consultant in the field of utility rates, contracts, and operating and management problems. During the war he was deputy chief of the fuel and allocations branch of the Office of War Utilities, War Production Board. For 15 years prior to 1942 he was with Niagara Hudson System in Niagara Falls and Buffalo, covering administrative and engineering assignments.

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NEMA Elects R. S. Edwards President for 1947

(See Front Cover)

R. Stafford Edwards, who was elected president of the National Electrical Manufacturers Association for the 1947 term, brings to this office a record of activity in the electrical industry dating from the days of World War I, and service to NEMA itself since 1933.

Mr. Edwards has been president of Edwards & Co., Inc., Norwalk, Conn., since 1936 and is of the third generation of the Edwards family to hold that position.

In 1916 he went to France and served in the French Army. After the entry of the United States into World War I, he came back to the United States, affiliating himself with the Western Electric Co. for a short education in radio, and then he returned to France with the 321st Field Signal Battalion. Returning to this country in 1919, he was employed in the supply department of the Western Electric Co. and in 1920 by the R. W. Lillie Corp.

He joined Edwards & Co. in 1921 as a salesman, becoming sales manager in 1926, vice-president in 1929 and president in 1936. He also is president of an associated company, Edwards of Canada, Ltd. In 1942 he was a special assistant to Donald M. Nelson, War Production Board, but resigned to devote all his time to his company's war production.

Mr. Edwards has represented his company in NEMA since 1933 and has served on many committees, including industrial relations, business development, advertising and publicity, subcommittee of the law committee, NEMA organization, Walsh-Healey, budget, and officers. Last year he was elected NEMA treasurer and a member of the board of governors.

G. F. Gant Takes Office As General Manager of TVA

George F. Gant, a veteran of more than eleven years' service with the Tennessee Valley Authority, has taken over the duties of general manager, succeeding Gordon R. Clapp, new chairman of TVA. The promotions of both officials became effective on November 1, when former TVA Chairman David E. Lilienthal resigned to assume the chairmanship of the new Atomic Energy Commission.

G. F. GANT

Mr. Gant received A. B. and M. A. degrees from the University of Nebraska and his Ph. D. at the University of Wisconsin. After serving with the Civilian Conservation Corps, he joined TVA's personnel staff in 1935, first as chief of the training division. He was appointed director of personnel in 1941. Mr. Gant is a member of the Society for Public Administration and the Committee on Southern Regional Studies and Education.

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▶ E. E. SCOFIELD, manager of the power contract department of the Washington Water Power Co., has relinquished his duties with the Spokane utility to become identified with the Lee F. Austin Co., electrical engineering firm. Mr. Scofield joined Washington Water Power Co. in 1922 and has served successively as an engineer in the commercial department, as an industrial engineer, manager of industrial sales,

assistant to the manager of the rate department, superintendent of power contracts and statistics and as a power consultant before becoming manager of the power contract department.

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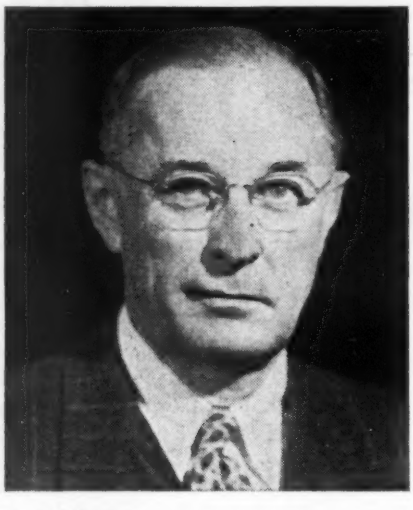
New Jersey Utility Names Mullen Vice-President

Clyde A. Mullen has been appointed to the newly created office of vice-president in charge of operations of Jersey Central Power & Light Co. with headquarters in Asbury Park. Mr. Mullen has been general superintendent of operations since July, 1945.

In the 33 years Mr. Mullen has been identified with the electrical industry, he has had a varied and well-rounded operating experience which began in Zanesville, Ohio, his native city, with the Ohio Electric Railway. Later, as assistant engineer of tests, he was affiliated with the Penn Central Power & Light Co. Returning to Ohio in 1914, he became electrical engineer of the



C. A. Mullen

Ohio Service Co. In 1923 he was appointed superintendent of substations, later transferring to Pennsylvania Power & Light Co. as assistant superintendent of construction.

It was in 1927 that he moved to Asbury Park where for four years he was superintendent of operations of the former Eastern New Jersey Power Co. Upon purchase of that company by Jersey Central Power & Light Co. in 1931 he became superintendent of the Morristown division. He then became general superintendent.

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▶ K. W. Kissick, president of the Frontier Power Co., Trinidad, Colo., has been elected president of the Colorado State Chamber of Commerce.

E. M. Skipper Named Locke Manufacturing Manager

Edward M. Skipper has been appointed to the position of manager of manufacturing of the Locke Insulator

E. M. Skipper

Corp., Baltimore, succeeding J. M. Gilfillan, who has resigned to join the New Jersey Porcelain Co.

Mr. Skipper became identified with Locke in the design engineering department in 1928. Two years later he was made assistant to the superintendent and in 1934 was appointed plant engineer. In 1938 he was made manufacturing engineer, and in 1945 assistant works manager.

C. G. Keogh, formerly production manager, has been appointed superintendent and W. F. Patten has been made acting production manager.

OBITUARY

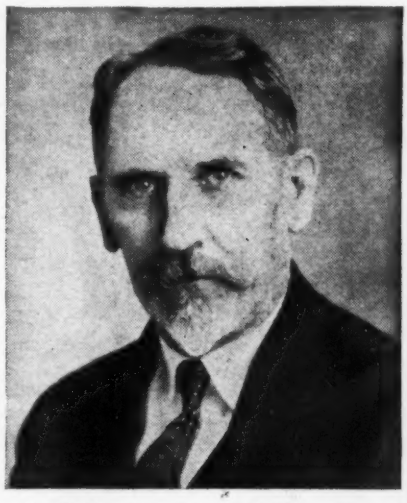
Sanford A. Moss

Sanford A. Moss, internationally known for his pioneer work on the turbo-supercharger and for many years consultant engineer for the General Electric Co., died in Lynn, Mass., on November 10 at the age of 74.

Dr. Moss entered the employ of General Electric Co. in 1903 at West Lynn, as an engineer in mechanical research and for a time worked under the late Dr. Charles P. Steinmetz in Schenectady, N. Y. Later he served at the company's Thomson Laboratory at the plant in Lynn, retiring in 1938. Since then he had been a consultant engineer for the company and he also served the Army in the same capacity in both World Wars.

A pioneer in the field of superchargers and compressors for airplanes and automobiles, Dr. Moss received in 1941 the Collier Aviation Trophy, jointly with the Army Air Forces, for outstanding aid to high-altitude flying by the development of the turbo-supercharger. The development also won for him the Sylvanus Albert Reed Award of the Institute of Aeronautical Sciences, the Holly Medal of the American Society of Mechanical Engineers, the Howard N. Potts Medal of the Franklin Institute and the New England Award of the Engineering Societies of New England. He has to his credit 45 patents on superchargers, compressors and other mechanical devices.

Born in San Francisco, he had served as vice-chairman of the American Standards Association's Project on Symbols for Science and Engineering,



and chairman of a sub-committee on Symbols for Heat and Aerodynamics. He was a member of A.S.M.E. and a fellow of the Institute of Aeronautical Sciences.

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▶ Edward W. Rockafellow, well known as one of the elder statesmen of the electrical jobbing industry, died on November 2 in Brooklyn, N. Y. He was 76 years old. He was identified with the Western Electric Co. from the early days of the electrical industry and for many years served in the capacity of general supply sales manager. It was in 1923 that he severed his connection with Western Electric to become a vice-president of the National Pole Co. in charge of sales, with headquarters in New York. Subsequently he was identified with the eastern sales office of the McGillis & Gibbs Co. of Milwaukee as manager with offices in New York. Mr. Rockafellow was one of the organizers of the Electrical Supply Jobbers Association and the Society for Electrical Development. For years he was active in the old National Electric Light Association, serving on many of its committees.

L-M AERIAL CABLE HARDWARE

is Designed to Give . . .

Greater SUPPORT — *Better* PROTECTION — *Utmost* CONVENIENCE

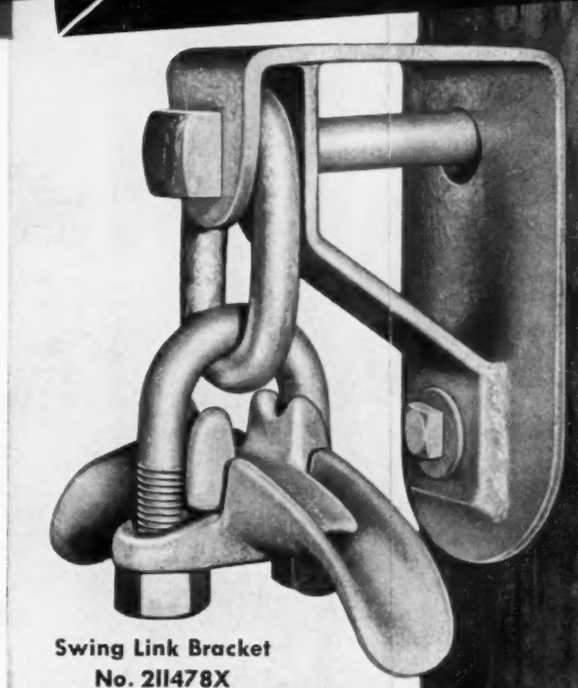
The efficiency and "life expectancy" of aerial cable is greatly increased when the strand is supported and protected by properly designed aerial cable hardware. L-M engineers accepted this fact as a challenge and spent many months studying the best methods of stringing and hanging aerial cable. They have developed a wide variety of design-right fittings, carefully constructed to meet the most rigid requirements.

Each of the clamps shown here is constructed of tough, durable steel, hot-dip galvanized, and designed to insure adequate support . . . to grip the cable firmly without injury to strand . . . and to provide utmost convenience in use.

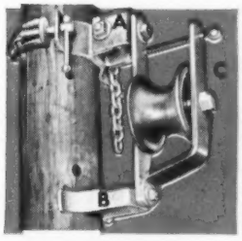
Complete details on these and other pole line hardware items will be sent you on request. Write Line Material Company, Aerial Cable Hardware Division, East Stroudsburg, Pennsylvania, or Milwaukee 1, Wisconsin.

Swing Link Bracket—No. 211478X

This bracket was especially designed to permit its use with many types of suspension clamps. (Shown here with No. 906 Suspension Clamp.) Large pole bearing surface affords wide range of versatility; a very flexible pole support. It may be used on angles up to thirty degrees.

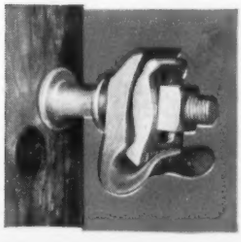


Swing Link Bracket
No. 211478X



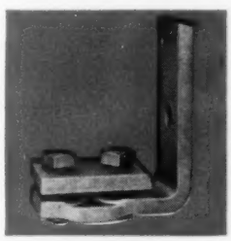
Cable Stringing Pulley, No. 285979X, swinging type

(A) Upper yoke with chain clamp for easy attachment to pole; (B) Lower yoke, pole support only; (C) Pulley, which may be used alone when bolted to pole. When cable is pulled on an angle, lower yoke swings out from pole to maintain maximum surface between pulley and cable. Lower yoke may be removed entirely to allow slight back angle.



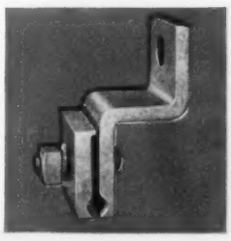
Neutral Wire Clamp, No. 223185X

Finest clamp of its kind where 500 to 1000 lbs. "in line" holding power is sufficient. Narrow enough to fit between winding tape. Lip supports messenger before tightening. Forged steel, hot-dip galvanized. Extension bolt, available in various lengths, with washer, square nut and Palnut, keeps clamp 1⅝″ from pole.



Messenger Hanger, No. 223179X, for pole or wall mounting

Greatest "in line" holding power (up to 2500 lbs.) of all L-M suspension fittings. Slotted groove clamps stranded messenger ¼″ to ½″ diameter, preventing side slip; rounded edges prevent damage to strand. Mounted to pole or wall with ½″ lag screw and ⅝″ through-bolt. Curved wire grooves permit use on curves or slight angles as well as straight runs.



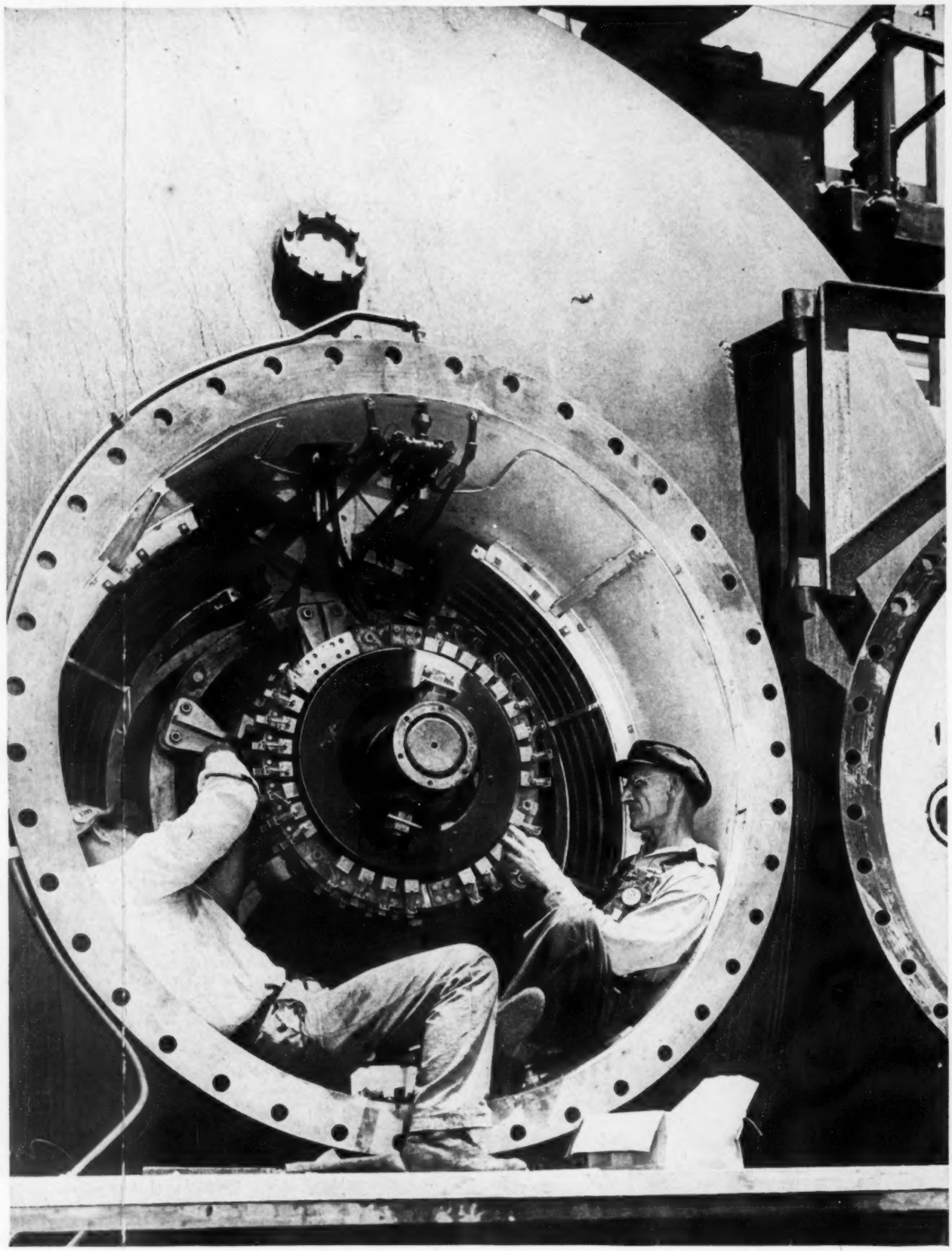
Extension Clamp, No. 223186X, for pole or wall mounting

One of many L-M clamps that permits installation of cable without cutting copper braid. Curved groove for messenger withstands vertical pull of more than 8,000 lbs. exceeding strength of messenger. Flared edges permit angle pull without danger of injury to strand. Body and clamp ⅜″ pressed steel; ½″ track bolt.

LINE MATERIAL
POLE LINE HARDWARE

L-M DISTRIBUTION EQUIPMENT INCLUDES: Distribution Transformers • Fuse Cutouts and Fuse Links • Lightning Arresters • Oil Switches • Pole Line Hardware • Line Construction Specialties • Underground Equipment • Fibre Conduit • Street and Airport Lighting Equipment • Wired Radio Control Equipment • Capacitors

THE INDUSTRY IN PICTURES



TWO-PURPOSE INSTALLATION—Workmen installing the collector-ring brush rigging on the exciter end of one of two 60,000-kva. synchronous condensers being installed at the High Grove substation of Southern California Edison Co. They will be used initially as a frequency-changer set to convert 60-cycle Boulder Dam power to 50 cycles

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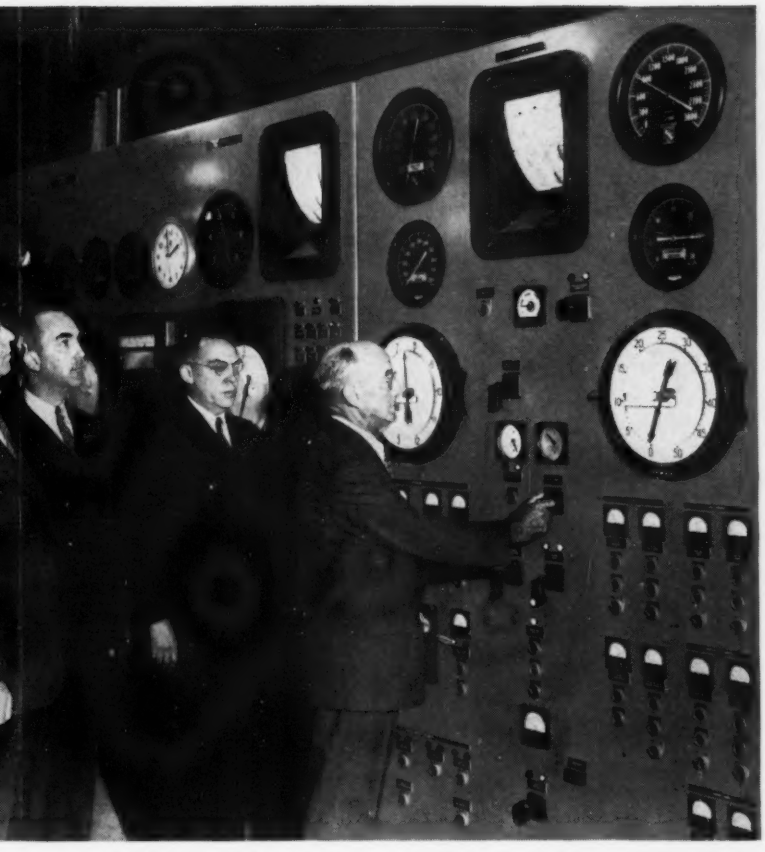
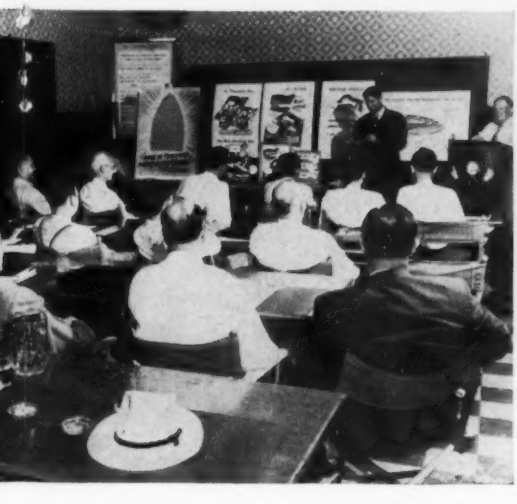


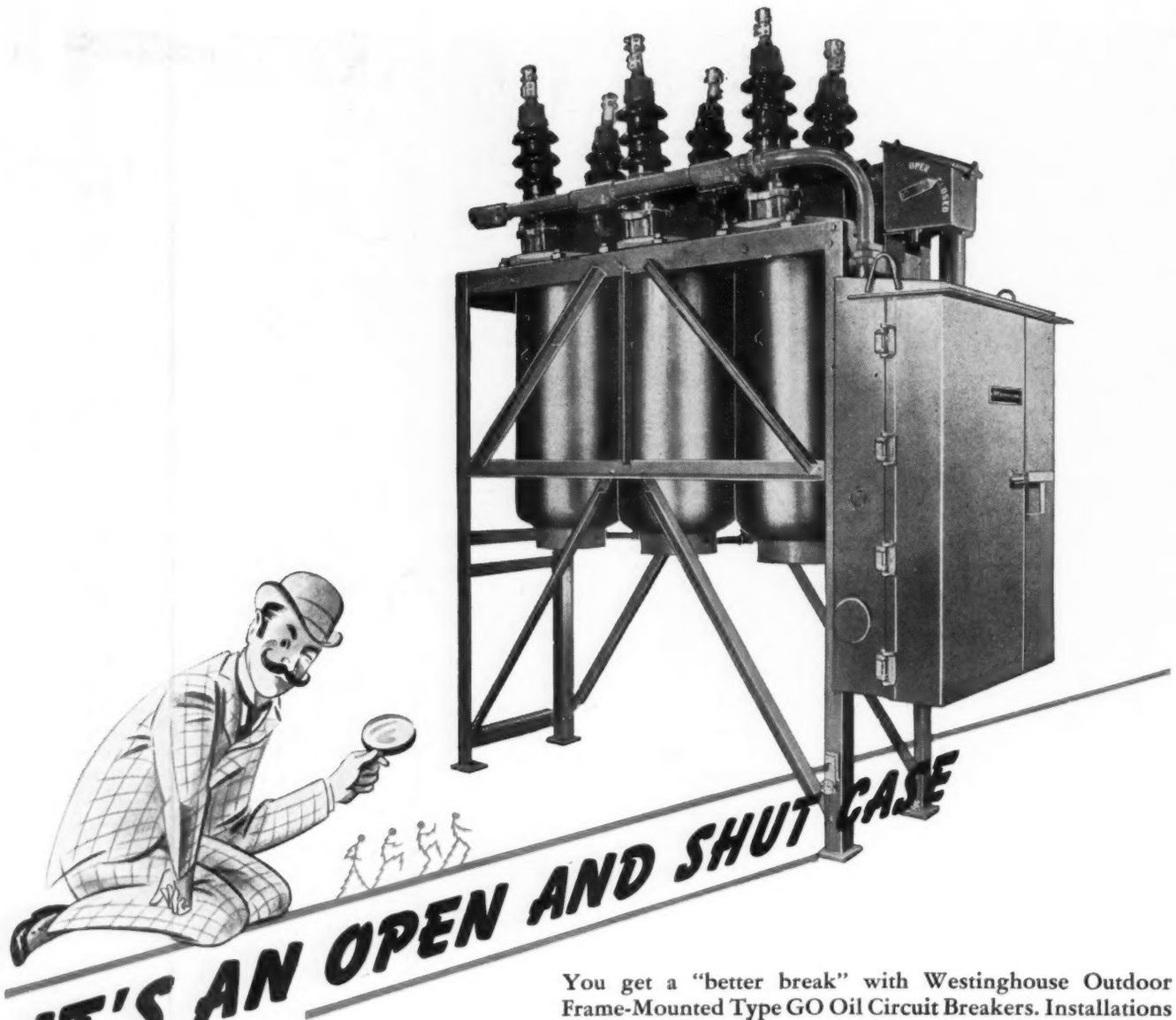
OM 1,000-DEGREE STEAM—N. M. Argabrite, the Atlantic City Electric Co., inaugurates service 000-kw. Missouri Avenue plant. This is the first steam electric station to use the high temperature F. at a pressure of 1,350 psi. (ELECTRICAL WORLD, age 60). Left to right are A. M. Newman, general nt; B. L. England, general manager; M. A. Reed, ntendent; and President Argabrite

SEEKING A FIRM FOUNDATION—Bureau of Reclamation diamond drillers probe bedrock at the site of the proposed Hungry Horse Dam on the South Fork of the Flathead River in Montana. The power plant is to have a capacity of 142,000 kw. The water stored by the dam, 1,500,000 acre-ft., will increase by some 78,000 kw. the firm power capacities of existing downstream power plants at Polson and Thompson Falls, Mont., and at Grand Coulee and Bonneville dams on the Columbia River

IN SELLING IRONS—Tom Kenna, Chicago dis-r, Proctor Electric Co., presents his product train-14 district sales supervisors who have been trained E.E.I. Basic Sales Training Course to sales and nist personnel of the Wisconsin Power & Light Co.



"FREE ELECTRICITY FOR 27 DAYS"—To publicize the fact that its customers would receive a 90 percent billing credit for September, the New Jersey Power & Light Co. played up the idea that 90 percent of September was 27 days and that the customers were actually getting free electricity for this period. In addition to newspaper advertisements, postcard bill advertising, and direct mail, the utility used this window display at its main office



IT'S AN OPEN AND SHUT CASE

"DE-ION" GRID
ARC CONTROL
1. Insulated iron plates provide magnetic control to pull arc into contact with fresh oil and lengthen arc path.
2. Oil trapped in oil pockets provides flow of fresh gas properly directed and vented for efficient circuit interruption at all current values.
WESTINGHOUSE

Westinghouse

PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

OUTDOOR FRAME-MOUNTED
OIL CIRCUIT BREAKERS

15 to 69 kv • 600 to 4000 amperes • 500,000 to 1,500,000 kva.

You get a "better break" with Westinghouse Outdoor Frame-Mounted Type GO Oil Circuit Breakers. Installations in the field confirm the fact that they contribute greatly to service continuity and system stability. That's an open and shut case.

It's also a case of "open" and "shut". Breakers open in eight cycles. Arcs are quenched instantly in the exclusive Westinghouse "De-ion" Grids. Reclosing in 20 or 35 cycles can be obtained with a pneumatic operating mechanism. Approximately 45-cycle reclosing is obtained with a solenoid operating mechanism.

This quick action sharply reduces fault clearance time, burning of contacts and deterioration of oil. The result: lower maintenance costs. Also contributing to lower maintenance costs are the Solder-Sealed condenser bushings . . . no gaskets . . . and the oiltight construction. All parts are easily accessible for inspection, and lowering the oil tanks is a one-man operation with a windlass-type tank lifter.

Westinghouse Outdoor Frame-Mounted Type GO Oil Circuit Breakers are completely assembled and thoroughly tested before shipment. There are no parts to install when the breaker is received—bushings, contacts and mechanisms are not dismantled for shipment. For complete details, write for Booklet B-3686. Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-60645

SEC RULINGS

The Securities and Exchange Commission recently issued a series of orders affecting electric utility companies.

EL PASO ELECTRIC CO.'s proposal to sell $6,000,000 of first mortgage bonds, due 1976, at competitive bidding has been approved. The commission reserved jurisdiction over the result of the bidding. With the proceeds and general funds the company will redeem its outstanding $6,500,000 of first mortgage, Series A, 3¾ percent bonds, due November 1, 1970, at 108 plus accrued interest. At the same time the commission complied with a request of the company and made its order, issued in conjunction with the decision, effective immediately so as not to delay the call of the bonds and thus cause El Paso additional expense. (Release No. 6944).

CENTRAL MASSACHUSETTS ELECTRIC CO.'s application for permission to issue and sell to the First National Bank of Boston its unsecured promissory note in the principal amount of $250,000, bearing interest at 1¾ percent annually and maturing in one year, and to use the proceeds to reimburse the company's treasury for capital expenditures made for new construction has been approved. (Release No. 6962).

WASHINGTON GAS & ELECTRIC CO. has been ordered to dispose of its interest in the Southern Utah Power Co., a wholly owned subsidiary, under the Holding Company Act. Washington Gas, which is being reorganized under the Bankruptcy Act, was formerly a subsidiary of the North American Gas & Electric Co. (Release No. 6955).

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Home Lighting Institute Names Specifications Group

The American Home Lighting Institute has appointed a specification committee to draw up illumination requirements for certified residential lighting fixtures incorporating recommendations of the Illuminating Engineering Society. Kitchen lighting fixtures will be the first studied.

D. L. Ripley, illuminating engineer of the Markel Electric Products, Inc., is chairman. Other members are Henry C. Clum, Art Metal Co.; Herman Gordon, Globe Lighting Products, Inc.; Richard G. Slauer, Sylvania Electric Products, Inc.; and Norman G. Vacha, John C. Virden Co.

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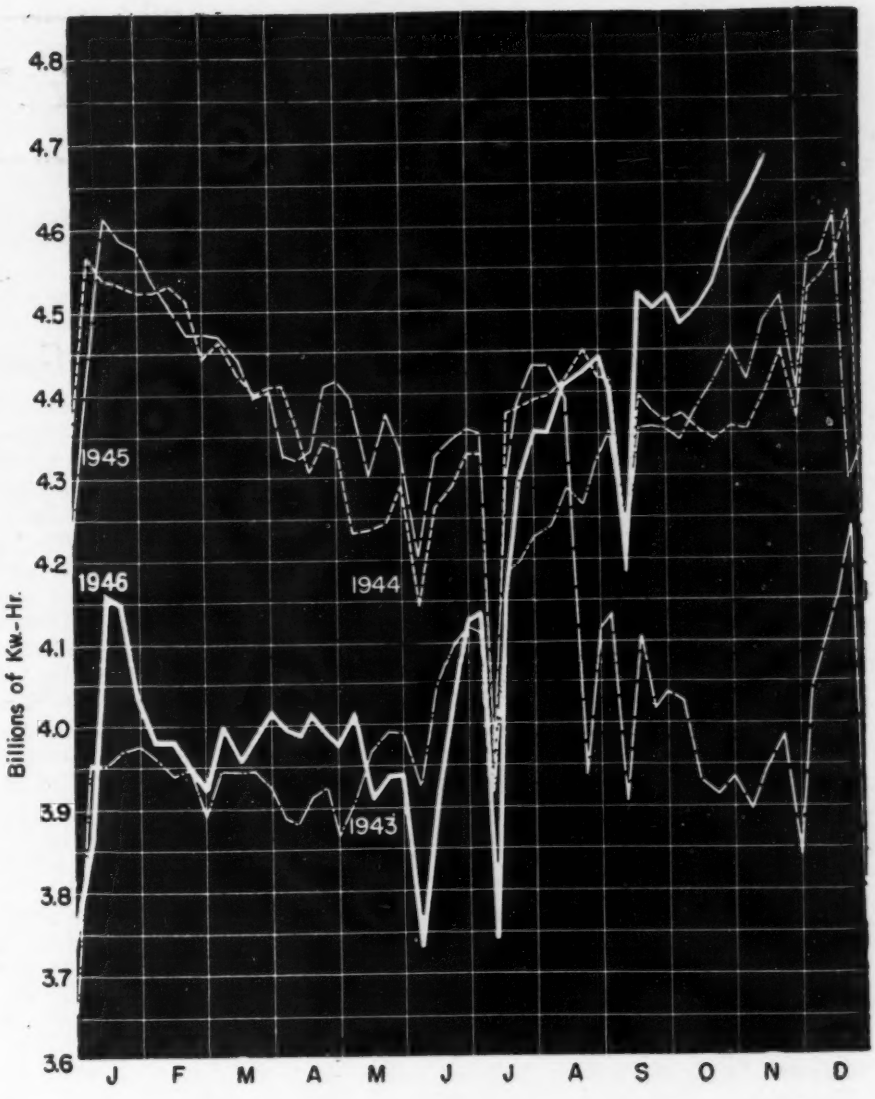
Shawinigan Raises Pay

Shawinigan Water & Power Co. has signed a contract with its employees association granting its 1,300 employees a 12 percent salary increase retroactive to July 1, 1946.



Another Record High Set by Output

Continuing the upward trend which began early in October, the electric output curve advanced again during the week ended November 9, 1946, setting another record high.

The amount of electrical energy distributed by the light and power industry during the week amounted to 4,682,085,000 kw.-hr. The previous high was 4,628,353,000 kw.-hr. for the preceding week ended November 2. During the week ended November 10, 1945, the amount of electrical energy distributed totaled 3,948,024,000 kw.-hr., this year's figure representing an increase of 18.6 percent. The over-all percent change for the country as a whole for the week ended November 2 as compared with the corresponding week of 1945 was an increase of 18.7 percent.

The largest individual increase was reported by the Southern States, 28.2 percent. The Rocky Mountain group, which showed a 10.3 percent increase for the week ended November 2, reported a 15.3 percent gain for the week ended November 9, as compared with the corresponding weeks of 1945.

Weekly Output, Millions Kw.-Hr.

1946		1945		1944	
Nov. 9	4,682	Nov. 10	3,948	Nov. 11	4,397
Nov. 2	4,628	Nov. 3	3,899	Nov. 4	4,355
Oct. 26	4,602	Oct. 27	3,937	Oct. 28	4,358
Oct. 19	4,540	Oct. 20	3,915	Oct. 21	4,345
Oct. 12	4,495	Oct. 13	3,934	Oct. 14	4,355
Oct. 5	4,478	Oct. 6	4,028	Oct. 7	4,375
Sept. 28	4,518	Sept. 29	4,039	Sept. 30	4,366
Sept. 21	4,507	Sept. 22	4,019	Sept. 23	4,377
Sept. 14	4,521	Sept. 15	4,106	Sept. 16	4,395
Sept. 7	4,184	Sept. 8	3,909	Sept. 9	4,228
Aug. 31	4,404	Sept. 1	4,137	Sept. 2	4,415
Aug. 24	4,444	Aug. 25	4,116	Aug. 26	4,418

Percent Change from Previous Year

	Nov. 9	Nov. 2	Oct. 26
New England	+11.7	+12.4	+ 8.3
Mid-Atlantic	+ 9.7	+10.0	+ 7.9
Central Industrial	+16.7	+15.0	+15.4
West Central	+14.5	+14.0	+13.4
Southern States	+28.2	+31.0	+31.3
Rocky Mountain	+15.3	+10.3	+ 7.0
Pacific Coast	+26.0	+27.3	+19.1
Total United States.	+18.6	+18.7	+16.9

MANUFACTURERS & MARKETS

'Go All Electric—The Modern Way' Spearheads Counteroffensive on LP-Gas

The electrical industry counteroffensive to the liquefied petroleum gas (LP-Gas) market developments became apparent at both national and local levels this week. The over-all plan, "Go All Electric—The Modern Way," was developed by the National Electrical Manufacturers Association and is now being mailed to utility and REA executives for use in their areas.

The plan for local attack is contained in a 32-page booklet, "A Program to Help You," and is designed to assist power suppliers both public and private, in organizational set-up, with concrete plans and effective techniques in overcoming "bottled" gas competition.

Offensive on a national scale actually began last spring with the issuance of the "Report to Utility Executives on LP—Gas Competition." This was designed to alert the electrical industry to the growth and future plans of its newest competitor. The report was followed in September by "LP-Gas Highlights," a mimeographed report on the market, distribution and organization of this industry as well as tables and formulas for computing cooking, water heating and refrigeration costs.

"Know Your Competitor LP - Gas," a second mimeographed report, contains information about "bottled" gas supplier-to-consumer contracts and some pertinent problems of this gas industry. It also contains three tables showing cost advantages of "Going All Electric" when compared to splitting the load between electricity and LP - Gas.

The project has three main objectives:

1. Acquaint the power companies and the cooperatives fully with the nature and extent of the competition.

2. Develop aggressive promotional material and sales tools to be used by power suppliers and dealers at the regional and local levels.

3. Maintain close and frequent contact with the power company merchandising and sales promotional executives, with their district and local offices, and with REA and its cooperatives, to insure unanimity of thought and coordination in timing and direction of effort.

"Report to Utility Executives" and the two mimeographed reports accomplished the first of the three objectives. "A Plan to Help You" carries out the second objective, making promotional material available. The material described resulted from cooperative efforts of about 30 utility merchandising and advertising executives and the NEMA Committee. This material includes four folders of the self-mailer type, four stuffers, that may be used for counter distribution, a decalcomania, an assortment of newspaper advertisements, a 24-sheet billboard paper, a 30 by 40-in. poster for indoor use, and radio scripts and publicity releases.

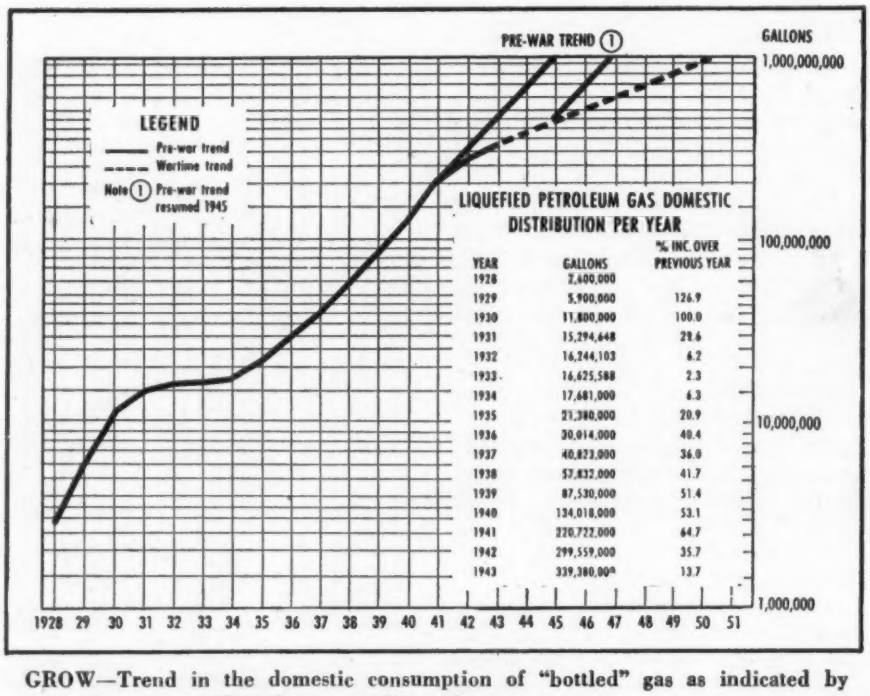
That part of the plan which treats "How to Make the Go All Electric Program Go" is broken down as follows:

1. Survey your territory—Know your market.
2. Establish a small town rural department.
3. Win the cooperation of distributors.
4. Enlist the effective support of dealers.
5. Check list of tested ways of aiding dealers.
6. Carry on a continued program of "Go All Electric" promotions.
7. Developing a publicity program.
8. Developing an advertising program.

The educational program described in the plan includes a retail sales manual entitled, "Electrical Appliance Sales Hand Book," by Laurence Wray, managing editor of *Electrical Merchandising*, a sound slide film, a motion picture and a teacher's guide.

The over-all program was supervised by NEMA's Rural and Suburban Market Development Committee, Harry M. Parsons, chairman. Coordination and development was done by the Planning Subcommittee under the direction of W. J. Cashman with assistance of NEMA staff under M. W. Thompson's guidance.

Mr. Thompson, in commenting on the need for the program and its timeliness, stated that already one-seventh of the rural and suburban market is using this



GROW—Trend in the domestic consumption of "bottled" gas as indicated by curve drawn from U. S. Bureau of Mines figures

gas and that one-fourteenth of the remaining market is being added each year. If this one-seventh used electricity for water heating and cooking, it would consume 7,200,000,000 kw.-hr. annually, or 72,000,000,000 kw-hr. during the lifetime of the products. "We are getting started as more and more appliances are coming on the market," he continued, "all we need now is to go — 'Go All Electric — The Modern Way.'"

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A-C Strikes Cause Drastic Decline in 1946 Billings

Net loss of $8,499,061 for the third quarter has been reported by the Allis-Chalmers Manufacturing Co. In the nine months of this year ended September 30, the loss was $17,425,493, President Walter Geist has announced.

The loss, which the company attributed largely to drastic decline in billings caused by strikes in all its plants except that at Oxnard, Calif., does not reflect refunds of federal income and excess profits taxes paid in prior years, Mr. Geist said. Amount of such refunds which might offset the loss, as well as credits for taxes that might otherwise be payable on possible profits of the last quarter of 1946, cannot be determined accurately until the close of the year.

Unfilled orders on September 30, amounted to $89,587,473, compared with $65,171,780 on June 30. Billings for the third quarter amounted to $12,217,411.

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Apex-British Pact Completed

Completion of a long-term cooperative working agreement between Apex Electrical Manufacturing Co., St. Louis, and Vactric, Ltd., London, has been announced. Under the terms of the agreement, Apex will make available to the British company its engineering services, production techniques, designs and patents. The agreement will not affect the arrangement whereby RCA-International distributes Apex products in all countries but the United States.

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Building Precipitators

Precipitators which will remove either solid or liquid particles from plant discharge gases are made available to American industry by Koppers Co., Inc., Walter F. Perkins, vice-president of the company and general manager of its shops division, has announced.

Generating Equipment Buying Still Heavy; Orders Indicate Definite Design Trends

The nation's electric power generating capacity will be increased by more than 3,500,000 kw. within the next two years when installation of steam turbine generators to be built by General Electric in that period is completed, according to officials of the company.

This new equipment will raise the capacity of steam turbine electric generating plants operated by electric light and power companies in this country to over 37,000,000 kw., a new high. An additional output of nearly 15,000,000 kw. of electric power is produced by hydroelectric stations.

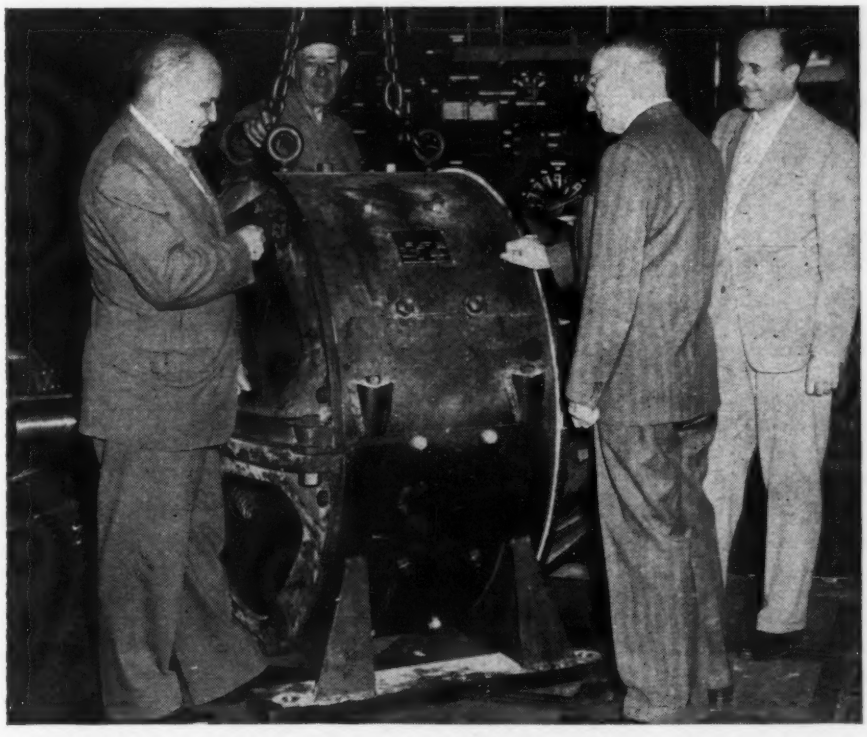
According to C. S. Coggeshall, manager of the company's turbine division, the turbine generators which will make up the 3½ million kw. of power range in output from 10,000 to 150,000 kw.

"Construction of this large amount of steam turbine generating capacity will exceed a high production rate that was established by orders from electric power companies beginning several years before the start of World War II," Mr. Coggeshall said. "In 1940 and the subsequent four war years we built more than 1,000,000 kw. of turbine-generator sets each year for utilities, and we expect to keep well above that figure for the next three years.

"A recent market analysis," he continued, "indicated that steam turbines producing 14,000,000 kw. should be installed within the next three to four years. Seventy-two percent of the operating companies of the country were reached by the survey, and the results were later confirmed by two other sources working independently.

"The tremendous buying at the present time is expected to continue after 1950, barring any national economic upset. Factors influencing this continued purchase of power producing equipment include not only the huge prospective buying of electric appliances, the construction of new homes and the greater use of electricity in industry, but also the need, after 1950, of replacements for obsolete turbine-generator units."

The average age of turbines being



ORIGINATOR INSPECTS 140,000TH CHILD—J. W. Corey, (left), president, Reliance Electric & Engineering Co., Cleveland, who, together with the company's recently retired senior vice-president A. M. MacCutcheon, developed the original Type T motor in 1914, inspects the 140,000th unit to come off the assembly line. F. E. Harrell (center), general works manager, and W. R. Hough, chief engineer, together with Mr. Corey, check the name plate after the electrical tests had been run and as the 300-hp. motor is about to be lifted to receive the final coat of paint

replaced today is approximately 31 years. However, the installed capacity curve did not rise sharply until 1915, indicating a larger percentage of steam-turbine generators will reach the retirement age at mid-century. Turbines now being produced, Mr. Coggeshall said, incorporate design changes that have greatly increased efficiency and reliability. During World War II power companies, by the use of modern steam turbines and power plant equipment, developed six times the amount of power with only twice the amount of coal consumed during World War I.

Mr. Coggeshall also stated that over 95 percent of the turbine-generator orders on the company's books are for domestic users, and that the apparatus is going to customers in 31 of the 48 states. New York leads with a total of six units to be installed with a total capacity of 265,000 kw., closely followed by New Jersey, Illinois, Ohio and Pennsylvania.

G. E. engineers see definite trends in some of the design features of the new equipment. A study of the cooling requirements shows that three out of four of the units on order will be hydrogen cooled. Thirty-six hundred rpm. seems to be the most popular operating speed as nearly 89 percent of the units are thus rated, with the remainder in the 1,800-rpm. category. Steam inlet conditions range from a low of 185 psi. at 500 deg. F. to a high of 2,000 psi. at 1,050 deg. F., with 72 percent of the turbines operating at inlet steam temperatures 900 deg. F. or above.

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Index of Training Films Includes Electric Sections

Editors of *Business Screen* magazine have compiled "The Index of Training Films," a 104-page booklet, listing more than 1,700 motion pictures and slide films, of which 157 are devoted exclusively to electrical and electronic subjects.

Films are listed according to subject matter and alphabetically by title. Complete information is given regarding sources from which the films may be obtained and type of film. Running times are included and individual films are catalogued as available through outright purchase, rental, or on a free-loan basis. Among the major sections of the book are Electronic Theory, Generators and Motors, Motor Maintenance and Repair, Wiring and Radio, and Communications.

The index may be obtained without charge from the Eastman Kodak Co., 343 State St., Rochester 4, N. Y.

Manufacturers Announce Plant Expansion Plans

Construction has started on a large addition to the main plant of the Merit Coil & Transformer Corp. at 4427 North Clark St., Chicago. The new unit is designed to utilize the latest developments in factory lighting and air conditioning, and will be equipped with the newest automatic machinery and devices for quantity production and precision control. The new addition, scheduled for completion early in 1947, will approximately double present capacity of the main plant.

Bakelite Corp. has announced plans for the construction of a plant, costing several million dollars, at Ottawa, Ill. The plant will be used for the manufacture of Vinylite plastic film and sheeting.

Foundation work is under way for the new plant which The Foxboro Co. Limited is erecting on a three and one-half acre site in the Ville LaSalle section of Montreal. The building will be ready for occupancy in the spring of 1947. The new plant, of brick and steel construction, will consolidate machining, metal finishing, and other basic operations, as well as the assembly and calibration of instruments, on one floor level. Foxboro Limited is affiliated with The Foxboro Co., Foxboro, Mass.

The first project is rapidly approaching completion in the post-war plant expansion program of the National Electric Products Corp. The rigid conduit department of the Ambridge, Pa., plant has been substantially enlarged. This has provided the adequate floor space needed for the new machinery required to meet the post-war demand for larger quantities of rigid conduit.

Trumbull Electric Manufacturing Co., Pacific Division, has received CPA approval for construction of a $40,000 addition to its plant at Seattle, Wash.

Swivelier Co. has announced acquisition of an additional 20,000 sq. ft. of factory space in the Bush Terminal Building #1, Brooklyn, N. Y. The Swivelier offices and main plant will continue to operate at the New York address, 30 Irving Place.

Construction of a new $1,000,000 wire and cable plant has been announced by Northern Electric Co., Ltd. The plant, which will cover a total land area of 90 acres with an immediate plant area of 50 acres and floor space of 300,000 sq ft., will be on Rockfield Ave., Lachine, Que. Completion of the plant is expected for summer, 1947, but installation of machinery and the moving of departments from the present Shearer St. plant will be carried on into 1948.

Tuttle & Kift, Inc., Chicago, manufacturer of electric heating units, switches, controls and gas valves, has purchased the recently built government-operated hemp mill at Kirkland, Ill., from the War Assets Administration, W. R. Tuttle, president and general manager, has announced. The entire electric switch and gas valve manufacturing departments are being moved to the newly acquired Kirkland plant, which contains 28,000 sq. ft. of floor space.

"BUYS SPACE" ON KIOSKS—To promote the sale of fluorescent lamps and radio tubes in Belgium, the International Division of Sylvania Electric Products Inc. is using space on kiosks, or newsstands, which dot the corners of many principal Brussels streets

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Electrical Manufacturers' Sales Up 14½ Percent

Electrical equipment, machinery and supplies total sales for the second quarter of 1946 showed a 14½ percent gain over the first quarter, according to the Securities and Exchange Commission. Total sales for the 37 companies reporting were $370,067,000 for the second quarter and $236,603,000 for the first.

The 24 apparatus and supplies manufacturers billed a total of $331,963,000 for the second quarter, which was a gain of 11.2 percent over the $208,557,000 first quarter total. The 13 electrical appliance manufacturers had a billing of $38,104,000 in the second quarter for a gain of 27.8 percent over the $28,046,000 first quarter.

NEW EQUIPMENT

Resonant Relay Rejects Unwanted Frequencies

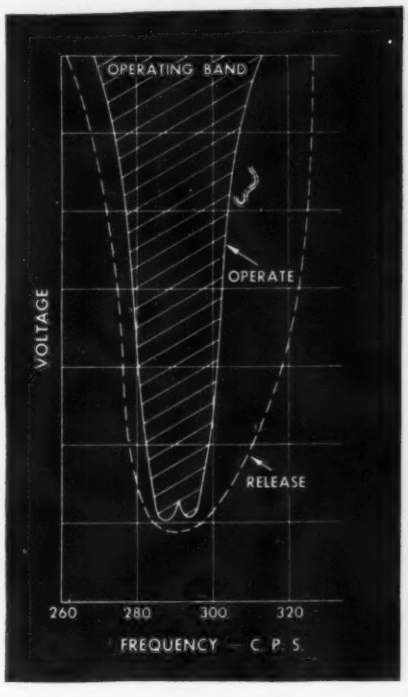
A NEW resonant relay, Type 182, which uses a vibrating reed mechanism adjusted at the factory to respond to a narrow band of frequencies and to reject all others, has been announced by Stevens-Arnold Co., 22 Elkins St., South Boston, Mass.

A small amount of energy received by the relay at its resonant frequency causes the contacts to vibrate. These contacts, in turn, are connected in series between the power supply and the circuit to be controlled. When the relay operates, the current from the power supply is delivered to the circuit to be controlled in pulses at the resonant frequency of the relay.

This pulsating current is obviously not suitable for direct control purposes and when "off-on" switching of a substantial amount of power is wanted, a conventional, slow-acting relay is used as an auxiliary "working" relay. The switching of "off-peak" water heaters is an example of such an application.

No auxiliary relay is needed for electronic applications of the resonant relay. In these cases the grid of a thyraton is triggered directly from the vibrating contacts of the resonant relay.

Standard frequencies on which the type 182 operate are 153, 170, 189, 210, 234, 260, 289, 322, 357, 398 and 442 cps. Those operating at higher or lower



frequencies are available as specials. The standard coil impedance is 500 ohms. Power required to drive the relay is approximately 5 milliwatts. They will operate at any voltage up to six times the voltage necessary to initiate the operation.

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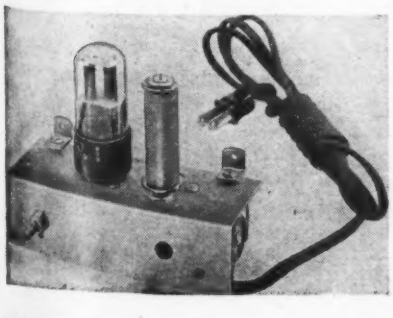
Oscillator Links Record Player with Receiving Set

A NEW phono oscillator for linking a record player or automatic record changer with a standard broadcast receiver has been developed by the D & M Manufacturing Co., 51 Lincoln Ave., Midland Park, N. J. No wire connections are required between the record player and the radio. The signal is reported as being strong and completely blanketing static or extraneous noise when the unit is located within 50 ft. of the receiver.



Oscillator is 2 in. wide, 5¼ in. long and 4¼ in. high. It has two mounting brackets, making it possible to mount in nearly any record player. It weighs 12 oz., utilizes a single tube—a dual purpose 12 SL7. The rectifier portion of this tube carries a load less than 2 milliamperes.

The transmitting frequency may be permeability tuned, by means of a slotted screw, through a range from 550 to 1,550 kc. Units are shipped tuned to 600 kc. Second harmonic transmission is equal in strength to transmission on the fundamental frequency so that in many cases the radio receiver can pick up the recorded music on either of two settings without retuning the oscillator. The unit operates on a 115-volt, a.c. or d.c. circuit and includes a built-in scratch filter. Ten ft. of antenna is furnished.

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Street Lighting Luminaire Places 50% of Light on Road

DESIGNED specifically for mercury vapor lamps, a new, type OV-20, enclosed street lighting luminaire announced by Westinghouse Electric Corp., Pittsburgh, Pa., directs approximately 50 percent of the lamp output on the roadway. Both reflector and refractor are oval in contour with a modern, streamlined appearance. Because of the unique shape, light from either a 20,000- or a 10,000-lumen mercury lamp is concentrated into two main beams on the roadway. A minimum amount of heat and light is reflected through the lamp source itself, resulting in a lower operating temperature for the lamp and a higher maintained efficiency for the luminaire, the company states.

The new luminaire is reported to produce a more uniform pavement brightness for higher visibility on the street. Control of the light at the higher angles plus the use of special glassware makes the refractor appear uniformly luminous over its entire width when viewed from any angle. The result is a source of high candlepower having a comparatively low surface brightness and less glare, the company reports.

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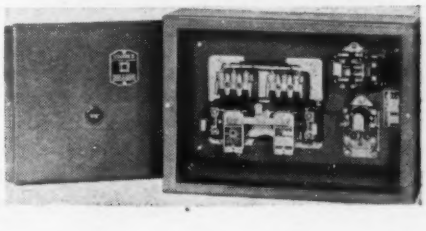
Controller Starts, Stops And Reverses Tumblers

A NEW CLASS 8920 controller for laundry service has been announced by industrial controller division, Square



D Co., 4041 North Richards St., Milwaukee 12, Wis. It consists of a reversing starter to change the direction of the machine motor; a synchronous motor-driven timer; and a brake relay which holds the solenoid brake off except when the automatic cycle is completed and the machine is stopped.

The timer, with quick make and break, automatically controls the number of revolutions which the washing machine or drying tumbler cylinder turns before it drifts to a stop and turns the same number of revolutions in the reverse direction.

Two 3-pole, mechanically interlocked contactors are used for reversing purposes. Overload protection is provided by two high-temperature type melting alloy relays as safeguards against single phasing, stalling or sustained motor overload. After an overload has occurred, the relays can be manually reset without removing the cover. Standard timers provide three reversals per minute; however, others are available as specials. The drift period is adjustable between 1 and 10 sec.

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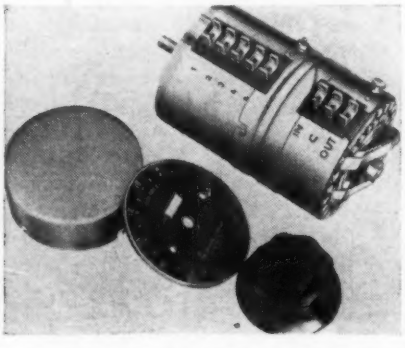
New Attenuator Follows Responses of Human Ear

A NEW tone compensating attenuator, which is essentially a ladder network designed so that the frequency characteristics follow the hearing response curves of the human ear, has been announced by the Daven Co., 191 Central Ave., Newark, N. J. The effect of that response, the company reports, is that the bass frequencies have a smaller loss than the middle or upper registers, without rendering a false or "pumped" response.

By proper external connection to lugs on the terminal board, it is possible to obtain six different attenuation vs. frequency curves with the unit, type LAC-720, varying from the "human ear type of response" to a flat frequency response. When the unit is wired for flat frequency response it functions as a straight ladder of 2.5 db. per step.



Chamber Checks Tubes in Wide Temperature Range

A NEW tube-testing chamber—capable of simulating operation of 80,000-ft. altitude under a wide range of temperature and humidity conditions—has been announced by the General Electric Co., Syracuse, N. Y. Called a "tube icebox," this high-altitude chamber was custom built to aid in the design, test and development of electronic tubes for many applications at varied temperatures ranging from 100 below to 175 F. above zero.

Originally designed to test tubes for war-time aircraft equipment, it is now equipped to handle multi-purpose testing of all tube types. Two dials outside the door automatically control, operate and record, on a 24-hour chart, conditions within the chamber, which is spacious enough to test most tubes together with their associated equipment. Six panes of glass in the door of the unit, the last about an inch thick, assure stability of altitude humidity and temperature ranges, the engineers report.

Leads into and out of the chamber furnish the engineers with detailed information on tube operation under varied conditions. There are 20 standard leads, twelve pairs of thermocouple leads and three high-frequency coaxial leads connected to a terminal board on one side of the chamber where measurements can be made, it was explained. Four pipes through the walls of the "tube icebox" also make provision for the testing of forced-air and water-cooled tube types.

Engineers said that elaborate refrigeration and pumping equipment located back of the chamber made possible arrival of the desired altitude and climatic conditions in a comparatively short period of time. Altitude is attained at the rate of 3,000 ft. a minute while 100 deg. below zero can be reached in about two hours. As high a temperature as 175 deg. above zero can be simulated in approximately 45 min.

The internal working area of the chamber is 3 ft. wide, 3 ft. high and 5 ft. deep. The over-all equipment occupies a space of approximately 7 by 8 by 15 feet.

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New Television Capacitor Ratings to 30 Mv., 500 Mmf.

HERMETICALLY SEALED high-voltage capacitors especially designed for use in rectified radio-frequency type power supplies for television receivers and other cathode-ray tube applications have been announced by Solar Mfg. Corp., 285 Madison Ave., New York 17, N. Y.

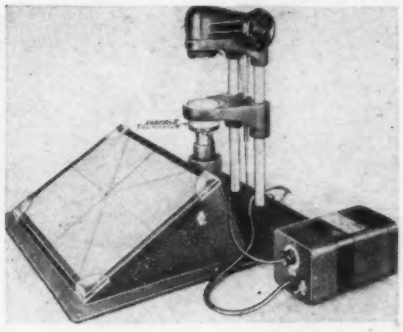
The capacitors are available in voltage ratings up to 30,000 kilovolts w.v.d.c. and in capacitances up to 500 mmf. They are housed in solder-sealed glass bushings with either ferrule terminals for mounting in standard fuse clips, or screw terminals for more rigid means of support and connection. The former construction is identified as Type QTMF and the latter as Type OTMH. Paper utilized in both types is oil impregnated under vacuum.

Surface Reflector Uses Ring of Low-Voltage Bulbs

To OVERCOME the handicaps often encountered in reflected image projection, a new type of reflector or surface illuminator has been developed for the Wilder Projector, reports the George Scheer Co., 200 Lafayette St., New York 13, N. Y.

Heretofore, it has been customary to produce reflected images by directing a beam of light obliquely against the surface of the work piece, through the use of one or more tilted mirrors. The new Wilder Surface Illuminator is a departure from previously accepted methods, in so far as it uses a ring of eight low-voltage bulbs, mounted in a compact circular lamp house which completely surrounds the projector lens. The high intensity light is directed vertically against the surface of the work piece to provide a uniform illumination over the full area of the lens and screen without shadows.

The arrangement is shown in the illustration. The surface illuminator is removable from the lens, though it may stay in position without interfering with the regular projection in transmitted light. In fact, wherever desirable, the image can be produced jointly in transmitted and reflected light. To make the surface illuminator fully self contained



and applicable to instruments now in the field, it is operated through a separate constant-voltage transformer, also shown.

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Heat-Treated Speed Nut Fits Popular Screws

A NEW low-priced line of heat-treated spring steel speed nuts has been announced by Tinnerman Products, Inc., 2119 Fulton Road, Cleveland 13, Ohio. The new line, known as the C 7000 Series, comprises all the sizes required to fit the ten most popular sizes of machine screws and sheet metal screws.

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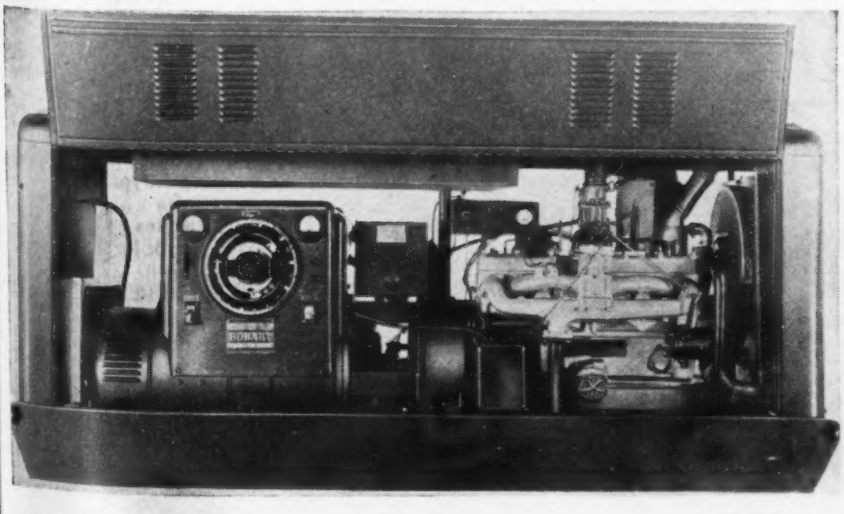
Combination Gas-Electric Drive 300-Amp. Arc Welder

A COMBINATION drive welding machine consisting of a 300-amp. generator and a 20-hp. induction motor mounted on a solid shaft and coupled to a Chrysler 6-cylinder industrial engine through an over-running clutch coupling has been announced by The Hobart Bros. Co., Troy, Ohio. When the generator is driven by the induction motor, the clutch will automatically "free wheel" and cut out the gasoline motor.

The induction motor is wound for dual voltage 220/440. Changeover is made by a double-throw knife switch. The motor is started by means of a pushbutton across-line contactor which is designed to work in conjunction with the voltage changeover knife switch so that no changes are necessary in the contactor for 220- or 440-volt operation.

The gasoline engine is furnished with an idling device. Single-unit construction is said to provide perfect alignment. The clutch is of ball-bearing construction with hardened races and sprags.



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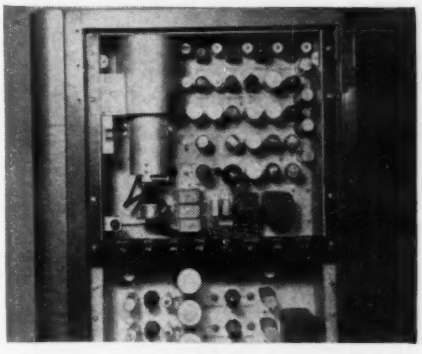
Television Test Equipment Facilitates Production

MASS PRODUCTION of television receivers and transmitters can be accelerated and uniform standards assured with test equipment now being made available by the Radio Corp. of America, Camden, N. J., it was announced recently. This equipment is already being used as essential studio components for the transmission of television pictures over the air.

The equipment, which supplies a television test signal of known quality, is composed of three interrelated units: a synchronizing generator, timing center essential in all studios and in the manufacture of television equipment; a monoscope camera, which delivers a



test pattern (picture); and a distribution amplifier, which amplifies and mixes the timing pulses of the synchronizing generator and impulses of the monoscope camera for delivery to the several test positions on the production line.

The synchronizing generator produces a complex waveform which carries four different impulses. These actuate the electronic scanning circuits in the television transmitter, much as a gearing system on a motion picture camera winds the film and insures passage of the proper number of frames per second. When a transmitted video wave reaches a receiver, this composite wave "triggers" the circuits which control scanning in the viewing tube and keeps them in step with the studio camera. A built-in oscilloscope on the synchronizing generator makes it possible to monitor the various waveforms generated by the equipment.

The monoscope camera provides a convenient means for producing a com-

posite test pattern which is known to be linear and of proper amplitude and frequency, simulating the signal received from the air. This permits the technician on the production line to determine at a glance the reproduction qualities of a receiver under test and allows for proper adjustment. It is also of use in television studios to determine whether the telecasting equipment is properly aligned.

The distribution amplifier receives the impulses from the synchronization generator and from either the studio cameras or the monoscope camera and mixes the two to form the composite television signal. This video signal can be sent to the transmitter for telecasting, or, in the case of the manufacturing plant, it can be further amplified by the distribution amplifier and channeled to as many as three test positions on the production line.

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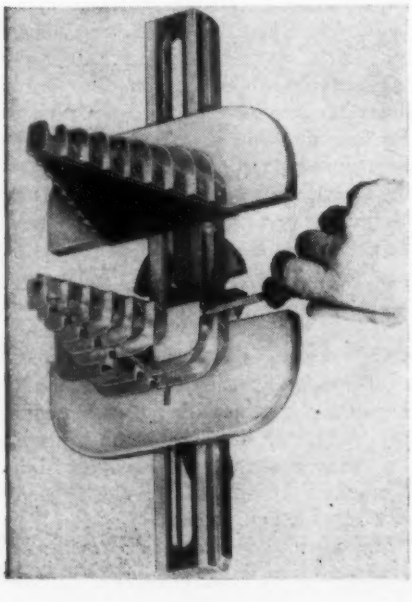
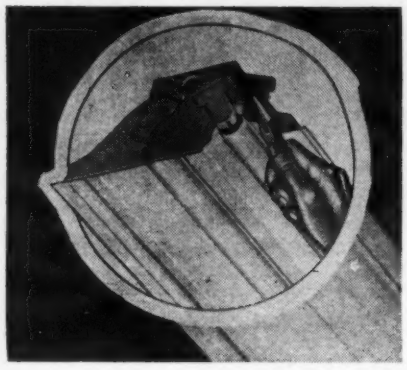
Adjustable Coil Winding Head Saves Production Time

A NEW TYPE of coil winder which is reported to save in concentric coil production time has been reported by the Continental Electric Co., 650 North Prairie Ave., Hawthorne, Calif. It is called the Adjustable Concentric Winding Head, Model U, and comprises nine pair segments, large to small sizes, eight of them adjustable by means of a screw.

The manufacturer reports that the Winding Head will accommodate coils for all types and sizes of single phase motors from a coil for a 1/25 hp., 24-slot, 6-pole stator to coils for a 3-hp., 36-slot, 2-pole stator, the latter seven coils to a group.



Recessed Troffers Utilize Same Length as Tube, Holder



THE NEW Recessed Troffers being offered by the Edwin F. Guth Co., 2615 Washington Blvd., St. Louis 3, Mo., have special K.O.'s in the ends (illustrated) which make possible accurate 48-in. lengths. These K.O.'s permit lampholders to be inset in the ends so that they are flush with the outside surface of the closed ends. Hence the new units require no more ceiling length than the 48 in. required for the fluorescent lamps and their lampholders.

The Troffers are built as complete units, ready to install. They are available in two types—deep types for one, two or three 40-watt lamps, and shallow types for one or two 40-watt lamps. All the Troffers have 300-deg. white reflectors but an Alzak reflector may be obtained with a special Alzak reflector liner.

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Overhead Connectors Feature Penetrox Compound

PENETROX, a compound which penetrates oxide on conductor surfaces, and seals them against air and moisture, is featured in the line of Hysplice connectors for overhead high-tension lines developed by Burndy Engineering Co., Inc., New York 54, N. Y. Thus it is claimed that an efficient connection results on oxidized cables.

These connectors are installed with standard company tools and are available in types for jumper loops and full tension service. Each connector is supplied filled with the Penetrox compound and sealed at each end. The cellulose seals are removed on the job, and the conductors inserted into the Penetrox-filled barrel in the usual manner. When the connector is indented onto the cable with the tool, the Penetrox wiping and sealing compound is forced over and around the individual strands, penetrating the oxide and providing a metal-to-metal connection of high conductivity.

The special dies supplied for the installation of connectors make a circular crimp in the connector, and are reported to produce low-resistance connections with high mechanical strength, and rounded edges to prevent corona discharge.

Connectors are available for use with either aluminum or copper cables, the copper connectors being filled with Penetrox-C and the aluminum connectors with Penetrox-A.

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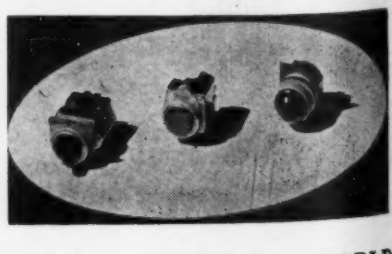
Oiltight Pushbutton Units, Selector Switches

A NEW LINE of oiltight pushbutton units, selector switches, and indicating lights especially designed for the machine tool and automotive industries has been announced by the control division, General Electric Co., Schenectady 5, N. Y. Protection against entrance of oil is provided throughout the line by a diaphragm seal and a rubber gasket. The gasket prevents oil from creeping in along the mounting bushing, while the diaphragm keeps it from entering between the button and the main body of the unit.

The momentary-contact pushbutton units are available in several forms. The single-pole unit provides a normally open and a normally closed circuit. The three-point unit provides two normally open circuits with common connection. Double-pole units are also available with either normally open or normally closed circuits. All contacts are of double-break type and are made of silver.

The selector switch unit is available in single-pole double-throw, or double-pole single-throw forms. Contacts are cam-operated.

The indicating-light unit has the same single-pole mounting arrangement as the pushbutton units and selector switches, which simplifies the construction of special or built-in pushbutton stations with indicating lights. They are available for use on 110-125 or 250 volts, a.c. or d.c., and may be used on higher voltages with separate resistors.